

Fertilizer Industry

CASE STUDY

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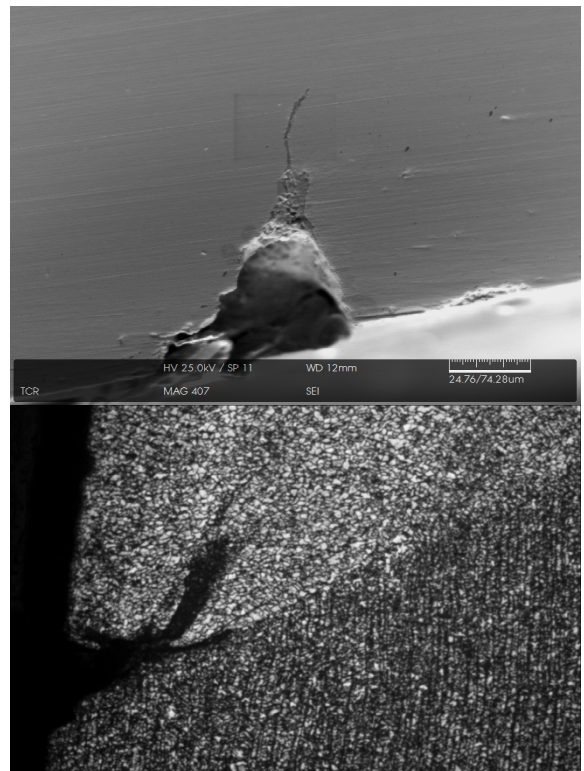
Key Facts

Sector Fertilizer Industry

Category Investigation of Cracking Behaviour of Ammonia Storage Tank

Problem

- A double wall double integrity, 10000MT, atmospheric pressure, Ammonia storage Tank displayed several cracks during inspection.
- Liquid ammonia is stored at -33°C . The tank is made from SA537-Class I plates



Diagnosis

- From the investigation, it is established that minor weld defect like undercut have been identified as crack at weld/HAZ and a minor crack is observed to have propagated from the weld defect due to pressure fluctuation in the tank.
- The other crack observed on the parent metal approximately 60mm away from weld of the ammonia storage tank is due to SCC, which could be due to presence of clut. It has resulted over a prolonged years of ammonia storage in presence of oxygen impurities.



Solution/Recommendations

- Periodic monitoring of oxygen and moisture may be done from ammonia tank. The oxygen content should be kept below 0.05ppm. This may be achieved with process control and checking on imported ammonia as well.
 - Proper commissioning and decommissioning procedure may be followed to avoid presence of oxygen and to mitigate the risk of SCC damage at that time.
 - To get the best benefit of the present inspection opportunity RBI of tank is highly recommended in a near future that will ensure the safe and reliable operation of Ammonia tank. It will also improve the operation and inspection knowledge that will help to mitigate the risk of tank damage.
 - It is recommended to carry out fracture mechanics calculation for "Leak before break" or "break before leak" to put operational limits for safe operation of tank in view of present repairing done to the tank.
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Contact Us

If you are interested to learn more about TCR Advanced, please send an email to: sohel@tcradvanced.com

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